

AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Currently Amended) A method of configuring an antenna
~~configuration characterized in that the antenna~~ the method comprising:
constructing the antenna to comprise comprising a plurality of antenna elements;
and is configured
configuring the antenna for line of sight (LOS) communication;

such that the antenna elements ~~separation~~ is set in relation to communications distance.

2. (Currently Amended) The method according to claim 1 wherein ~~characterized in that the antenna is configured~~ configuring the antenna such that the separation of the antenna elements ~~separation~~ is set in relation to communications wavelength.

3. (Currently Amended) The method according to claim 1 wherein ~~or 2 characterized in that the antenna configuration maximizes~~ multiple-input multiple-output (MIMO) MIMO channel capacity.

4. (Currently Amended) The method according to claim 1 wherein ~~or 2 characterized in that for a linear antenna, the~~ separation of the antenna elements ~~separation~~ is set in relation to $\sqrt{D\lambda/N}$ where D is communications distance, λ is communication wavelength and N is number of antenna elements.

5. (Currently Amended) The method according to claim 1 wherein ~~or 2 characterized in that for a square grid antenna the antenna elements,~~ separation

is set in relation to $\sqrt{D\lambda/N}$ where D is communications distance, λ is communication wavelength and N is number of antenna elements.

6. (Currently Amended) The method according to claim 5 wherein ~~characterized in that~~ $N=n^2$ for n an integer greater than 1.

7. (Currently Amended) The method according to claim 1 wherein ~~or 2 characterized in that~~ for a rectangular grid antenna, the separation of the antenna elements ~~separation~~ is set in relation to $\sqrt{D\lambda/N}$ where D is communications distance, λ is communication wavelength and N is number of antenna elements in dimension of separation.

8. (Currently Amended) The method according to claim 7 wherein ~~characterized in that~~ the dimension of separation is horizontal dimension.

9. (Currently Amended) The method according to claim 7 wherein ~~characterized in that~~ the dimension of separation is vertical dimension.

10. (Currently Amended) The method according to claim 1 wherein ~~or 2 characterized in that~~ for a triangular grid antenna with three antenna elements, the separation of the antenna elements ~~separation~~ is set in relation to $\sqrt{D\lambda/3}$, where D is communications distance and λ is communication wavelength.

11. (Currently Amended) A method of configuring an antenna ~~antenna configuration characterized in that~~ an antenna comprising, the method comprising
constructing the antenna to comprise a plurality of clusters of ~~one or more~~ antenna elements; and
configuring the antenna is configured such that the plurality of clusters of antenna elements are separated by a distance set in relation to communications distance.

12. (Currently Amended) The method according to claim 11 wherein ~~characterized in that~~ the antenna is configured such that the plurality of clusters of antenna elements are separated by a distance set in relation to communication wavelength.

13. (Currently Amended) The method according to claim 11 wherein ~~or 12 characterized in that~~ for a linear antenna the plurality of clusters of antenna elements are separated by a distance set in relation to $\sqrt{D\lambda/L}$ where D is communications distance, λ is communication wavelength and L is number of clusters.

14. (Currently Amended) The method according to claim 11 wherein ~~characterized in that~~ for a square grid antenna the plurality of clusters of antenna elements ~~clusters~~ are separated by a distance set in relation to $\sqrt{D\lambda/L}$ where D is communications distance, λ is communication wavelength and L is number of clusters.

15. (Currently Amended) The method according to claim 14 wherein ~~characterized in that~~ $L=l^2$ for l an integer greater than 1.

16. (Currently Amended) The method according to claim 11 wherein ~~or 12 characterized in that~~ the antenna elements within a cluster are separated by a distance smaller than the smallest distance between clusters.

17. (Currently Amended) The method according to claim 1 wherein ~~or 2 characterized in that~~ the antenna configuration is three-dimensional.

18. (Currently Amended) The method according to claim 17 wherein ~~characterized in that~~ the antenna configuration comprises two layers, where each layer comprises a planar arrangement of antenna elements on a square grid.

19. (Currently Amended) The method according to claim 17 wherein ~~characterized in that~~ the antenna configuration comprises antenna elements positioned equidistant in a three-dimensional space.

20. (Currently Amended) The method according to claim 19 wherein ~~characterized in that~~ the antenna elements are positioned to vertices of a cube.

21. (Currently Amended) The method according to claim 19 wherein ~~characterized in that~~ the antenna elements are positioned to vertices of a tetrahedron.

22. (Currently Amended) The method according to claim 11 wherein any of claims 1, 2, 11 and 12 characterized in that the antenna elements are fed with signals processed according to singular value decomposition for a transmission channel over the communications distance.

23. (Currently Amended) The method according to claim 22 wherein ~~characterized in that~~ the transmission channel considered is a flat fading sub-carrier.

24. (Currently Amended) The method according to claim 22 wherein ~~characterized in that~~ the transmission channel considered is an OFDM sub-carrier.

25. (Currently Amended) The method according to claim 11 wherein any of claims 1, 2, 11 and 12 characterized in that the signals received from the antenna elements are processed according to zero forcing for a transmission channel over the communications distance.

26. (Currently Amended) The method according to claim 11 wherein any of claims 1, 2, 11 and 12 characterized in that the signals received from the

antenna elements are processed to minimize mean square error for a transmission channel over the communications distance.

27. (Currently Amended) The method according to claim 11 wherein any ~~of claims 1,2, 11,12, 22 and 25 characterized in that~~ signal processing of signals received or to be transmitted is performed at high-frequency.

28. (Currently Amended) The method according to claim 27 wherein ~~e-h characterized in that~~ the processing is performed by one or more 3-dB hybrids.

29. (Currently Amended) The method according to claim 27 wherein ~~e-h characterized in that~~ the processing is performed by one or more Butler matrix directional couplers.

30. (Currently Amended) The method according to claim 27 wherein ~~e-h characterized in that~~ the processing is performed by an arrangement of microstrip.

31. (Currently Amended) The method according to claim 27 wherein ~~e-h characterized in that~~ the processing is performed by an arrangement of waveguides.

32. (Currently Amended) The method according to claim 31 wherein any ~~of claims 1-31 characterized in that~~ the antenna configuration is a radio antenna configuration.

33. (Currently Amended) The method according to claim 31 wherein any ~~of claims 1-31 characterized in that~~ the antenna configuration is a configuration of sensors or actuators for optical communications.

34. (Currently Amended) An antenna configuration ~~e-h-a-r-a-c-t-e-r-i-z-e-d~~ ~~by the antenna~~ comprising:

a plurality of antenna elements; and
means for configuring the plurality of antenna elements for line of sight (LOS)
communication configured such that the antenna elements separation is set in relation
to communications distance.

35. (Currently Amended) The antenna configuration according to claim
34 ~~wherein characterized by~~ the antenna is configured such that the antenna
elements separation is set in relation to communication wavelength.

36. (Currently Amended) The antenna configuration according to claim
34 ~~wherein or 35 characterized in that~~ the antenna configuration maximizes MIMO
channel capacity.

37. (Currently Amended) The antenna configuration according to claim
34 ~~wherein or 35 characterized by~~ the antenna elements separation is set in relation to
 $\sqrt{D\lambda/N}$ where D is communications distance, λ is communication wavelength and N
is number of antenna elements, and wherein the antenna configuration is a linear
antenna configuration.

38. (Currently Amended) The antenna configuration according to claim
34 ~~wherein or 35 characterized by~~ the antenna elements separation is set in relation to
 $\sqrt{D\lambda/N}$ where D is communications distance, λ is communication wavelength and N
is number of antenna elements, and wherein the antenna configuration is a square grid
antenna configuration.

39. (Currently Amended) The antenna configuration according to claim
38 ~~wherein characterized in that~~ $N=n^2$ for n an integer greater than 1.

40. (Currently Amended) The antenna according to claim 34 wherein or
~~35 characterized by~~ the antenna elements separation is set in relation to

$\sqrt{D\lambda/N}$ where D is communications distance, λ is communication wavelength and N is number of antenna elements in dimension of separation, for a rectangular grid antenna.

41. (Currently Amended) The antenna according to claim 40 wherein ~~characterized in that~~ the dimension of separation is horizontal dimension.

42. (Currently Amended) The antenna according to claim 40 wherein ~~characterized in that~~ the dimension of separation is vertical dimension.

43. (Currently Amended) The antenna according to claim 34 wherein ~~or 35 characterized by~~ the antenna elements separation is set in relation to $\sqrt{D\lambda/3}$, where D is communications distance and λ is communication wavelength, a triangular grid antenna with three antenna elements.

44. (Currently Amended) The antenna configuration according to claim 34, ~~or 35 characterized by~~ the antenna configuration being three-dimensional.

45. (Currently Amended) The antenna configuration according to claim 44, ~~characterized by~~ the antenna configuration comprising two layers, where each layer comprises a planar arrangement of antenna elements on a square grid.

46. (Currently Amended) The antenna configuration according to claim 44, ~~characterized by~~ the antenna configuration comprising antenna elements positioned equidistant in a three-dimensional space.

47. (Currently Amended) The antenna configuration according to claim 46, ~~characterized by~~ the antenna elements being positioned to vertices of a cube.

48. (Currently Amended) The method according to claim 46, ~~characterized by~~ the antenna elements being positioned to vertices of a tetrahedron.

49. (Currently Amended) An antenna configuration ~~characterized by an antenna~~ comprising:
a plurality of clusters of ~~one or more~~ antenna elements;
means for configuring configured the antenna elements such that the plurality of clusters of antenna elements ~~clusters~~ are separated by a distance set in relation to communications distance.

50. (Currently Amended) The antenna configuration according to claim 49, ~~characterized by~~ the antenna being configured such that the plurality of clusters of antenna elements ~~clusters~~ of antenna elements are separated by a distance set in relation to communication wave- length.

51. (Currently Amended) The antenna configuration according to claim 49, ~~or 50 characterized by~~ the plurality of clusters of antenna elements ~~clusters~~ being separated by a distance set in relation to $\sqrt{D\lambda/L}$, where D is communications distance, λ is communication wavelength and L is number of clusters, and wherein the antenna configuration is a linear antenna configuration.

52. (Currently Amended) The antenna configuration according to claim 49, ~~or 50 characterized by~~ the plurality of clusters of antenna elements ~~clusters~~ being separated by a distance set in relation to $\sqrt{D\lambda/\sqrt{L}}$ where D is communications distance, λ is communication wavelength and L is number of clusters and wherein the antenna configuration is a square grid antenna configuration.

53. (Currently Amended) The antenna configuration according to claim 52, ~~characterized in that~~ $L=l^2$ for l an integer greater than 1.

54. (Currently Amended) The antenna configuration according to claim ~~49, or 50 characterized in that~~ the antenna elements within a cluster are separated by a distance smaller than the smallest distance between the plurality of clusters of antenna elements ~~clusters~~.

55. (Currently Amended) The antenna configuration according to claim 49, any of claims 34, 35, 49 and 50 characterized by one or more antenna element feeders being adapted to feed the antenna elements with signals processed according to singular value decomposition for a transmission channel over the communications distance.

56. (Currently Amended) The antenna configuration according to claim ~~55, wherein characterized in that~~ the transmission channel considered is a flat fading sub-carrier.

57. (Currently Amended) The antenna configuration according to claim ~~55, wherein characterized in that~~ the transmission channel considered is an OFDM sub-carrier.

58. (Currently Amended) The antenna configuration according to claim 49, wherein any of claims 34, 35, 49 and 50 characterized by one or more processing elements are adapted to process signals received from the antenna elements according to zero forcing for a transmission channel over the communications distance.

59. (Currently Amended) The antenna configuration according to claim 49, wherein any of claims 34, 35, 49 and 50 characterized by one or more processing elements are adapted to process signals received from the antenna elements to minimize mean square error for a transmission channel over the communications distance.

60. (Currently Amended) The antenna configuration according to claim 49, wherein ~~any of claims 34, 35, 49, 50, 55 and 58 characterized by~~ one or more processing elements are adapted to process at high-frequency signals received or to be transmitted.

61. (Currently Amended) The antenna configuration according to claim 60, ~~characterized by~~ the one or more processing elements being one or more 3-dB hybrids.

62. (Currently Amended) The antenna configuration method according to claim 60, ~~27 characterized by~~ the one or more processing elements being one or more Butler matrix directional couplers.

63. (Currently Amended) The antenna configuration according to claim 60, ~~characterized by~~ the one or more processing elements being an arrangement of microstrip.

64. (Currently Amended) The antenna configuration according to claim 60, ~~characterized by~~ the one or more processing elements being an arrangement of waveguides.

65. (Currently Amended) The antenna configuration according to claim 49, ~~any of claims 34-64 characterized by~~ the antenna elements being electrically active elements.

66. (Currently Amended) The antenna configuration according to claim 49, ~~any of claims 34-64 characterized by~~ the antenna elements being directors.

67. (Currently Amended) The antenna configuration according to claim 66, ~~characterized by~~ the directors being reflectors.

68. (Currently Amended) The antenna configuration according to claim 49, ~~any of claims 34-67 characterized by the antenna elements being arranged in a~~ symmetrically in a circular pattern.

69. (Currently Amended) The antenna configuration according to claim 49, ~~any of claims 34-67 characterized by the antenna elements being arranged in a~~ hexagonal pattern.

70. (Currently Amended) The antenna configuration according to claim 49, ~~any of claims 34-67 characterized by the antenna elements being mounted on~~ position adjustable rods or wires.

71. (Currently Amended) The antenna configuration according to claim 70, ~~characterized by the position adjustable rods or wires being~~ electromechanically adjustable.

72. (Currently Amended) The antenna configuration according to claim 71 ~~wherein characterized in that the adjustable position is adaptive to~~ propagation channel properties corresponding to a measured channel matrix.

73. (Currently Amended) The antenna configuration according to claim 49, ~~any of claims 34-69 characterized by the antenna configuration being adapted to a~~ predetermined range of communications distances.

74. (Currently Amended) An antenna configuration, ~~wherein characterized by the antenna configuration comprising a plurality of antenna elements, of~~ which a subset forms an active set of antenna elements, the active antenna elements forming an antenna configuration according to claim 34 ~~any of claims 34-69~~.

75. (Currently Amended) The antenna configuration according to claim 49, wherein ~~any of claims 34-74 characterized in that~~ the antenna configuration is a radio antenna configuration.

76. (Currently Amended) The antenna configuration according to claim 49, wherein ~~any of claims 34-74 characterized in that~~ the antenna configuration is a configuration of sensors or actuators for optical communications.

77. (Currently Amended) A communications system wherein ~~characterized by~~ means for carrying out the method in claim 1 ~~any of claims 1-31~~.

78. (Currently Amended) A communications system wherein ~~characterized by~~ a plurality of devices in claim 34 ~~any of claims 34-74~~.

79. (Currently Amended) The communications system according to claim 78 wherein ~~characterized in that~~ the antenna elements distances are set different for a first and a second antenna, the two antennas operating in pair, such that the geometrical average of the elements distance of the first, antenna, d_1 , and the elements distance of the second antenna, d_2 , is the effective antenna elements distance.